Homework 1

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(a).

1. In the for loop statement: (let i = x.length - 1; i > 0; i--), it should be i>=0. Otherwise, the for loop will not detect the 0^{th} index.
2. In the for loop statement: (let i = 0; i < x.length; i++), it should be (let i = x.length - 1; i >= 0; i--). Otherwise, the for loop will return the index of the first 0 element instead of the last one.
3. In the if statement in the for loop: (x[i] >= 0), it should be >. Otherwise, 0 will be counted as a positive number.
4. In this part, there are four possible situations: odd positive, even positive, odd negative, and even negative. The modulo 2 operator will separate the four situations into 1, 0, -1, -0. Thus, in the if statement in the for loop: (x[i] % 2 === 1 || x[i] > 0), it should be Math.abs(x[i]). And we can cover all the situations we want.

(b). Not execute the fault

1. test: x = []; y = 3; Expected = -1
2. test: x = []; Expected = -1
3. test: x = []; Expected = 0
4. test: x = []; Expected = 0

(c). Execute the fault, but not result in an error state

1. test: x = [2, 3, 5]; y = 4; Expected = -1; Actual = -1
2. test: x = [1, 1, 0]; Expected = 2; Actual = 2
3. test: x = [-4, 2, -1, 2]; Expected = 2; Actual = 2
4. test: x = [3, 2, 0, 1, 4]; Expected = 3; Actual = 3

(d). Result in an error state, but a failure

1. test: x = [2, 3, 5]; y = 4; Expected = -1; Actual = -1
2. test: x = [0, 1, 1]; Expected = 0; Actual = 0
3. test: x = [-4, 2, 1, 2]; Expected = 2; Actual = 2
4. test: x = [3, 2, 0, 1, 4]; Expected = 3; Actual = 3

(e)

1. While running this program, we hope the for loop can traverse all elements in x. However, since we're starting with i=1, this is not really happening.
2. While running this program, we hope to catch the last 0 in the array. However, it returns when it reads the first 0. The only reason the program does not result in a failure is the last 0 is also the first one.
3. While running this program, we hope to catch all elements larger than 0 in the array. However, the if statement also triggers the counter if the element is 0. The reason why no failure resulted is there's no 0 in the array.
4. While running this program, we hope to catch all elements that are odd of positive in the array. However, the if statement only triggers the counter if the element is positive. The reason why no failure resulted is there are no odd negative numbers in the array.